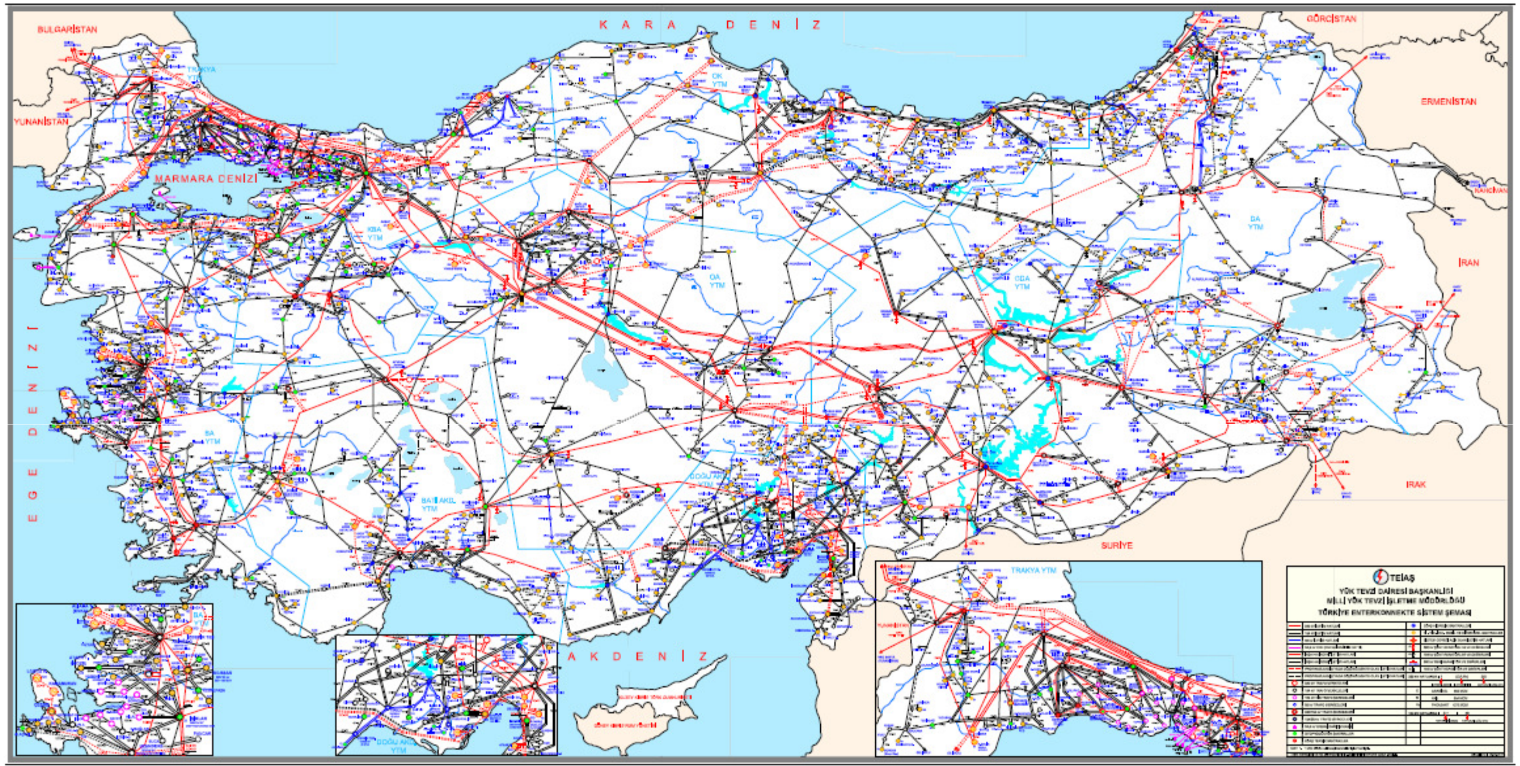
RECENT DEVELOPMENTS IN TURKISH EPS

TURKISH ELECTRICITY TRANSMISSION CORPORATION
(TEIAS)

19 June 2013

TÜRKİYE ELEKTRİK İLETİM A.Ş.

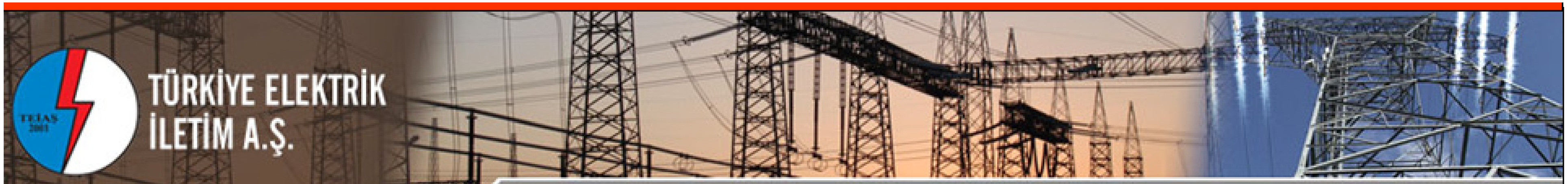
TURKISH POWER SYSTEM



- NUMBER OF SUBSTATIONS
- 400 kV 86
- 220 kV 1
- 154 kV 547
- 66 kV 14

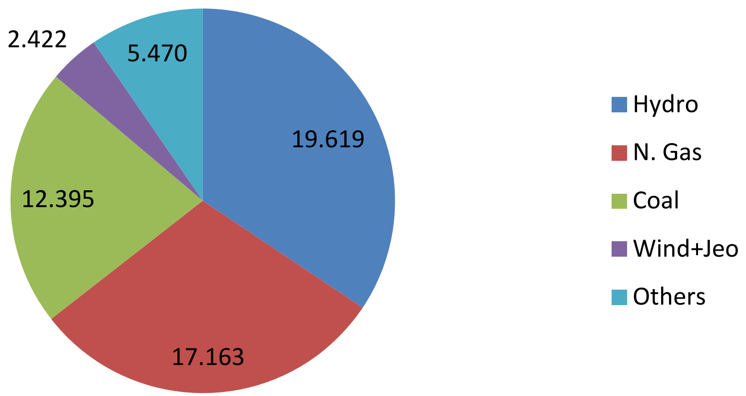
TOTAL: 648 (114.746 MVA)

LENGTH OF TRANSMISSION LINES
- 400 kV 16401 km
- 154 kV 33539 km
- 220 kV 85 km
- 66 kV 508 km
- 154 kV and 400 kV cable length 268 km
- TOTAL 50.801 km

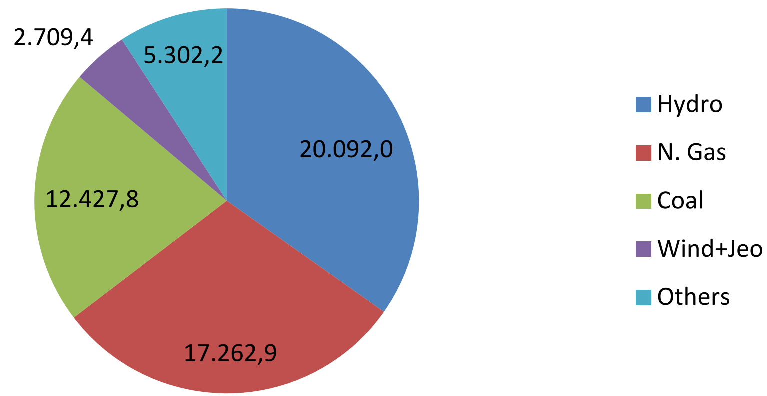


INSTALLED CAPACITY & PEAK LOAD

INSTALLED CAPACITY (MW) IN2012

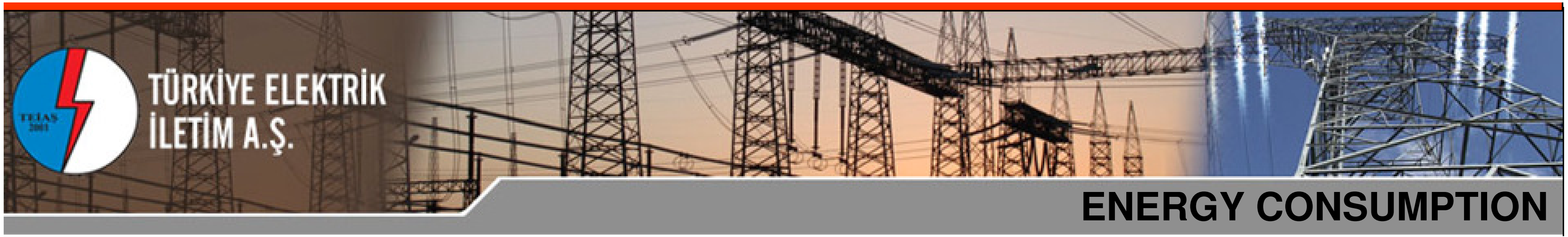


INSTALLED CAPACITY (MW) IN 2013



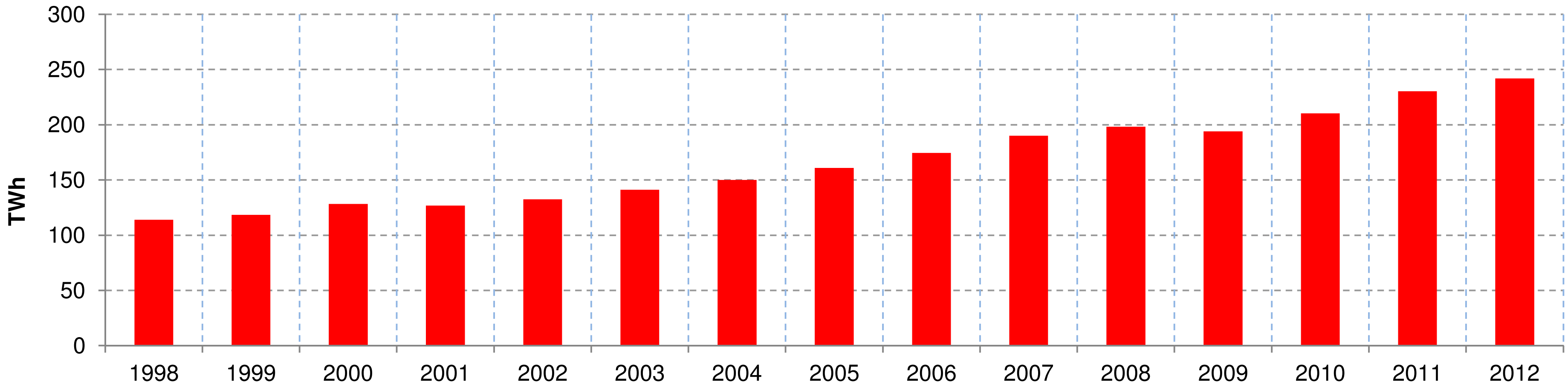
2012	
Installed Capacity	57.071 MW
Consumption	241,9 TWh
Peak Load	39.045 MW (27.07.2012 14:30)

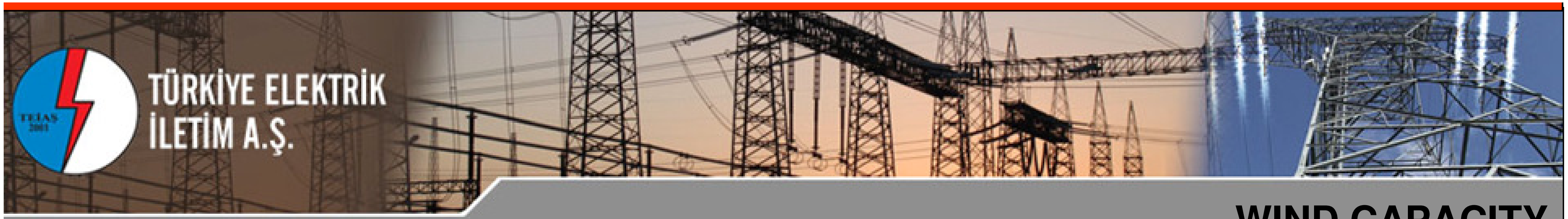
2013, May	
Installed Capacity	58.322 MW
Consumption	60,5 TWh
Peak Load	36.135 MW (January, 2013)



ENERGY CONSUMPTION

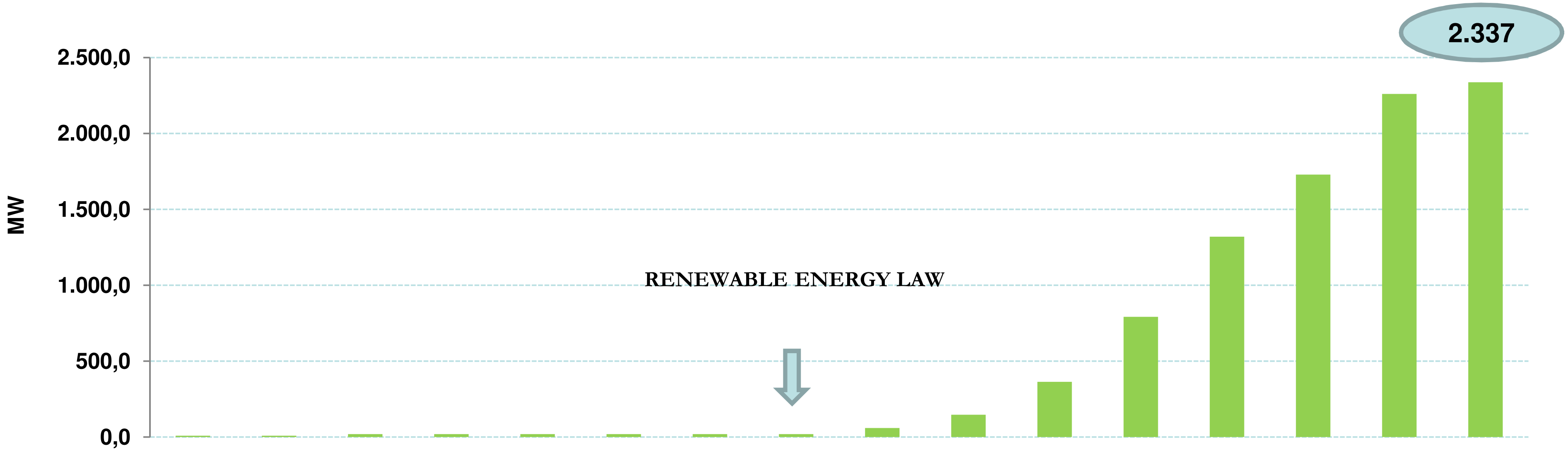
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CONSUMPTION (TWh)	114,0	118,5	128,3	126,9	132,6	141,2	150,0	160,8	174,6	190,0	198,1	194,1	210,4	230,3	241,9
INCREASE(%)	8,1	3,9	8,3	-1,1	4,5	6,5	6,3	7,2	8,6	8,8	4,3	-2,0	8,4	9,4	5,0





WIND CAPACITY

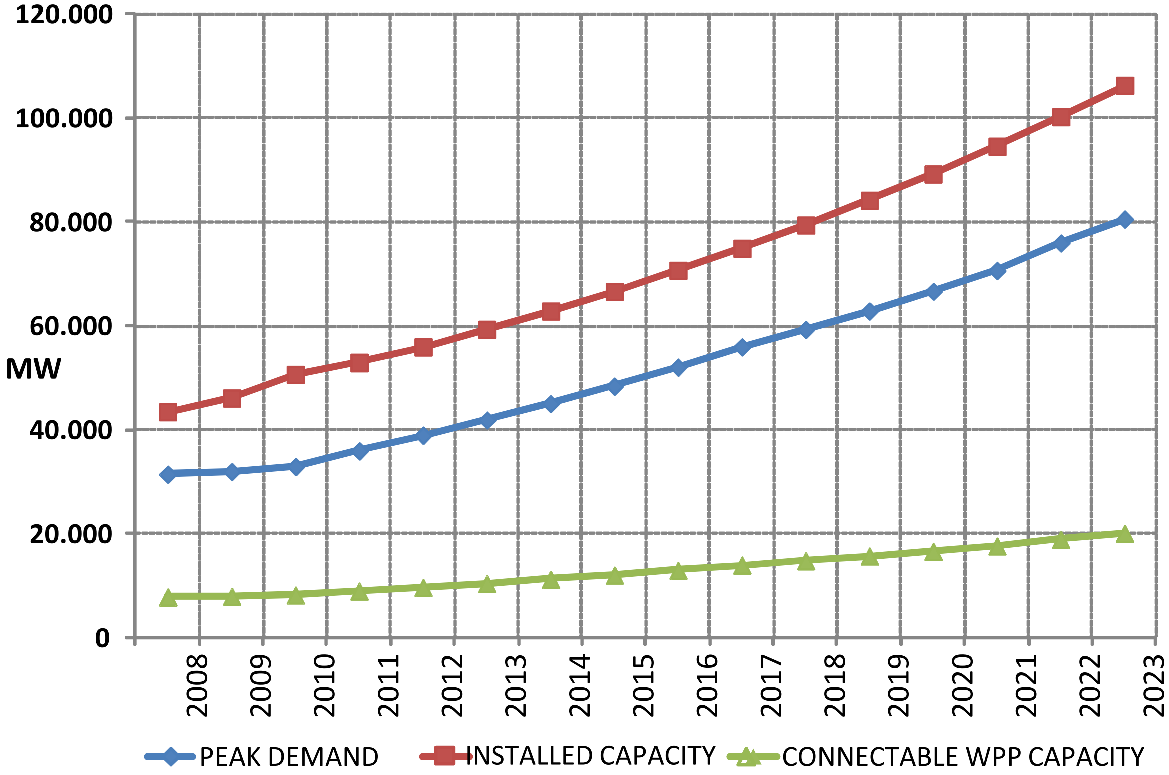
INSTALLED WIND POWER CAPACITY



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
WIND (MW)	8,7	8,7	18,9	18,9	18,9	18,9	18,9	20,1	59,0	146,3	363,7	791,6	1.320,2	1.728,7	2.260,5	**2.337,0**

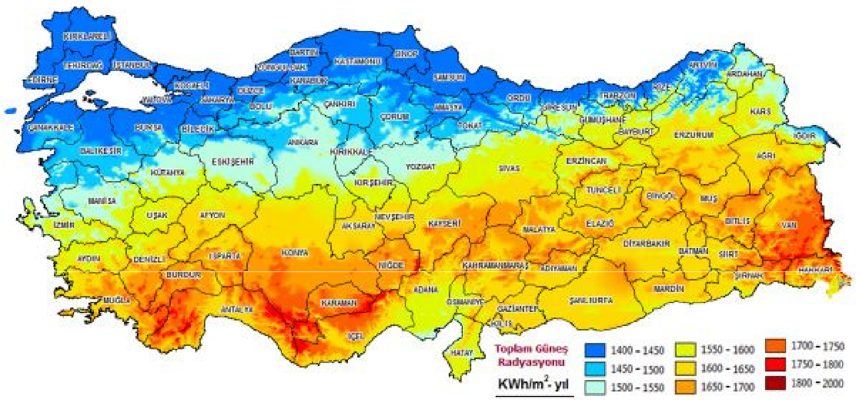
5

INSTALLED TOTAL CAPACITY, MAXIMUM DEMAND, WIND POWER THAT CAN BE CONNECTED TO SYSTEM



Turkey's aim is to have 20.000 MW Wind Power installed capacity by 2023.

SOLAR RADIATION MAP



Total of 600 MW connectable Solar Power plant capacity is declared by TEIAS for 2013.

This capacity is distributed to regions according to province area, average radiation values above 1.620 kWh/m^2.

For the capacity, applications will be taken by EMRA in June 2013, and after approval by TEIAS, licensing process begins.

Amendment to Renewables Law (No:6094)

• Law includes regulations regarding the promotion of renewable based electricity generation. In addition, it covers the procedures and principles for the conservation of the renewable energy resource areas, certification of the energy generated from these resources and utilization of these resources.

• Amendment to Law in 2011;

  • A new support scheme is introduced. Different feed-in prices for different renewable based electricity generation.
    - 7.3 US cents per kWh for hydro and wind
    - 10,5 US cents per kWh for geothermal
    - 13.3 US cents per kWh for solar and biomass (including waste gases)

  • In addition, a certain support of 0.4 to 3.5 US cents per kWh is also given to the plants for the utilisation of domestically manufactured technical equipments.

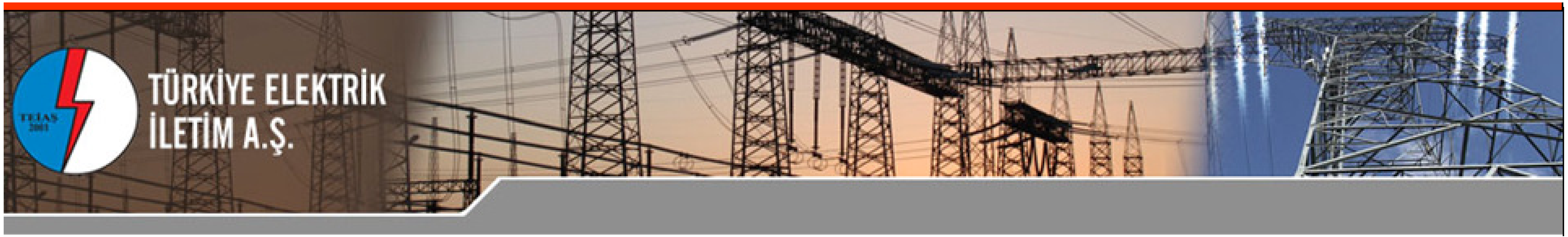
  • The implementation period of the incentive mechanism covers the power plants to be commissioned before 31.12.2015 with the Law (previously: 31.12.2011).

Wind, Solar and Hydro Investments

For Wind and Solar Investments : Competition is done for Applications for the same Transformer SS

➔ Biggest offer for contribution share per MW wins

For HPP Investments :, Competition is done for Applications for the same Source
➔ Biggest offer for HPP Source contribution share per MW each year, wins the water usage right



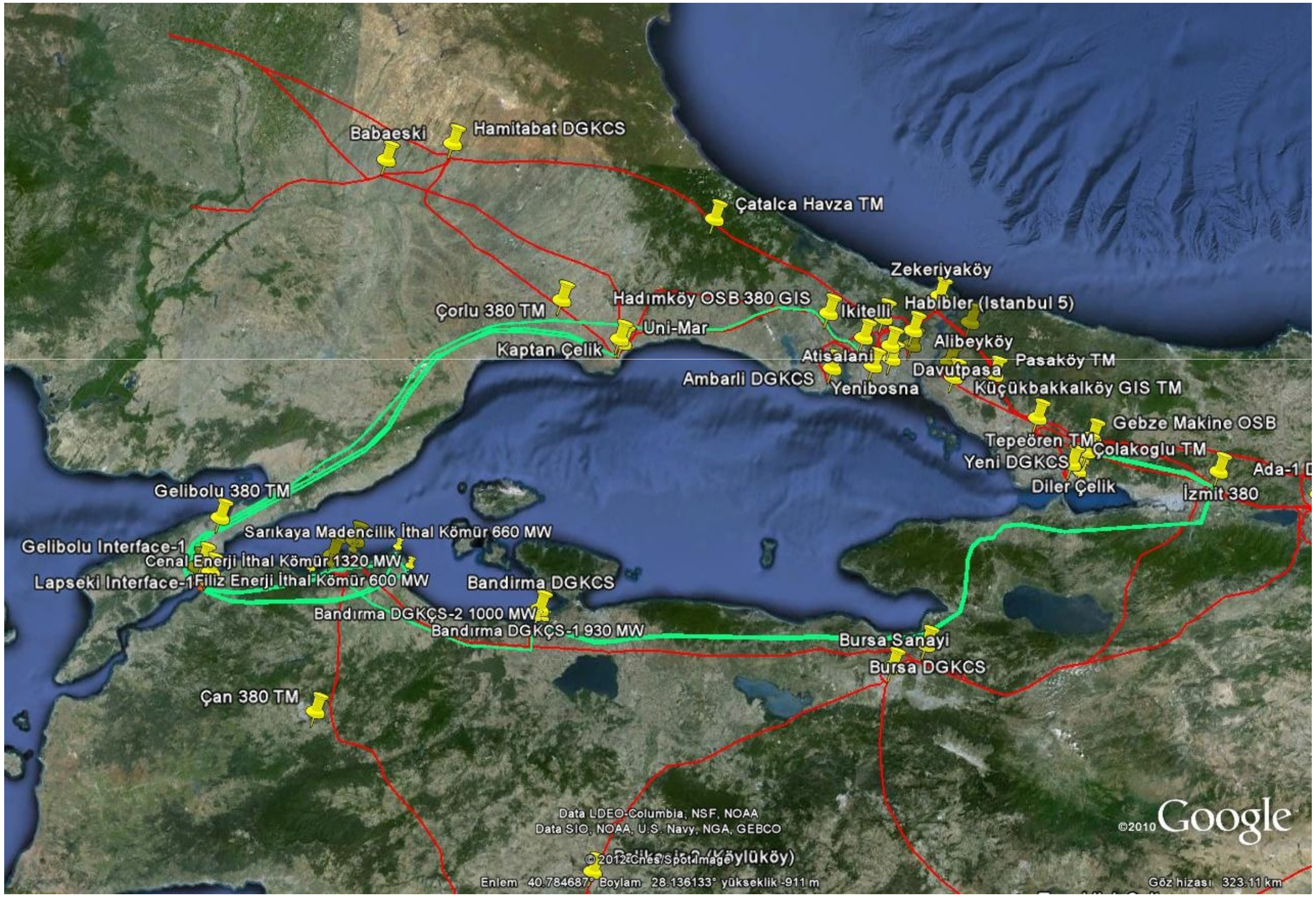
INVESTMENTS ON TRANSMISSION SYSTEM

31 December 2012

(xThousand TL)

Project Description	Project amount		Total Project Price	Year 2012 Investment	as, 31.12.2012	Realization %
			Total	Total	Investment expences	
TRANSMISSION FACILITIES	475		4.698.629	571.728	658.474	115,17%
RESEARCH	5		3.200	650	240	36,99%
İŞLETMELER GRUBU	14		157.850	45.702	27.721	60,66%
MACHINES & EQUIPMENT	15		91.200	31.900	30.794	96,53%
VEHİCLES	1		20	20	4	21%
TOTAL	510		4.950.899	650.000	717.233	110,34%
FAİZ+KUR FARKI+İŞÇİLİK					14.323	
INVESTMENT PROG SUM	510		4.950.899	650.000	731.556	112,54%

400 kV GENERAL OVERVİEW of İSTANBUL AND THRACE REGION



- Existing 400 kV OHL
- Planned 400 kV OHL

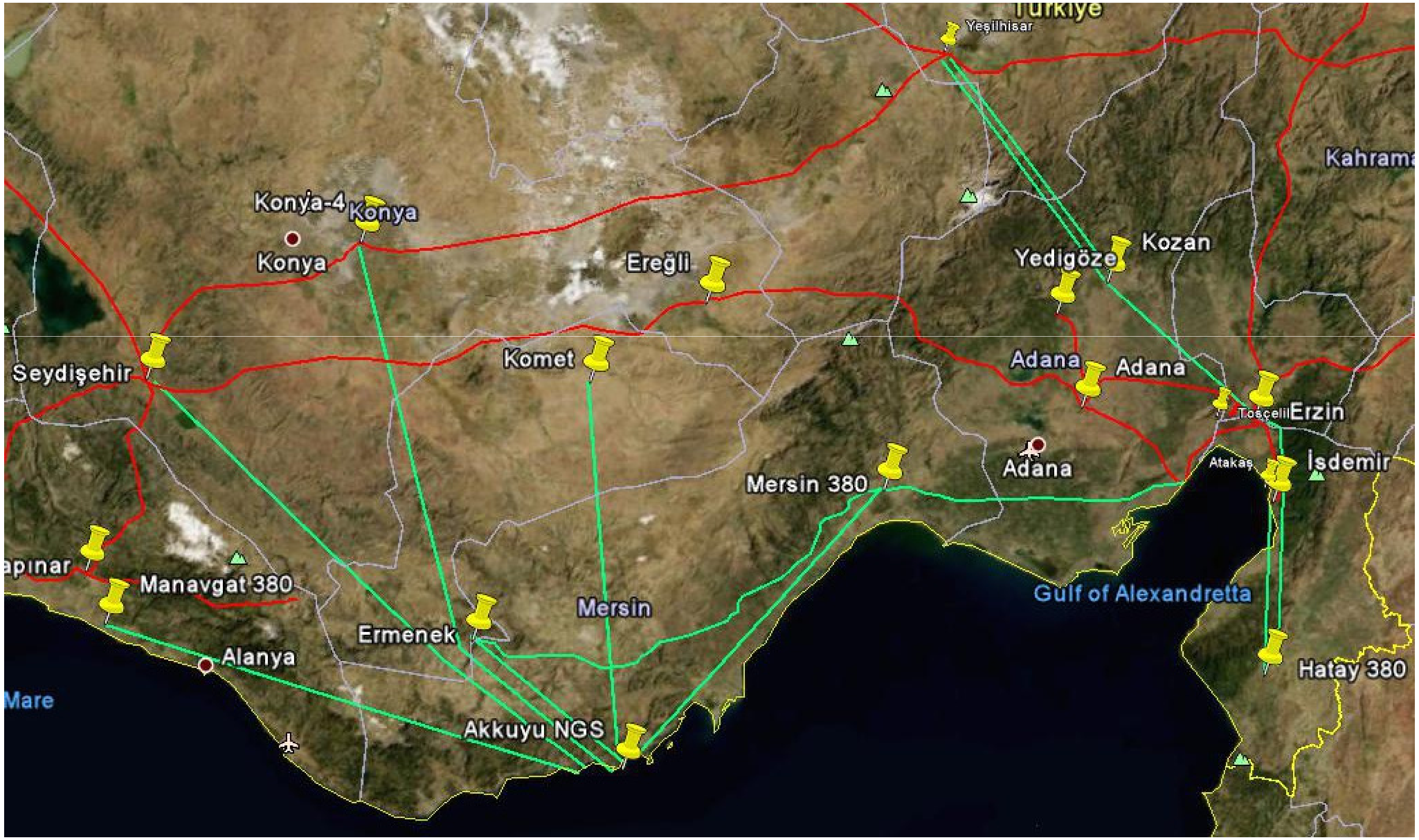
TÜRKİYE ELEKTRİK İLETİM A.Ş.

GEORGIA – TURKEY INTERCONNECTION

- Existing 400 kV OHL
- Planned 400 kV OHL

TÜRKİYE ELEKTRİK İLETİM A.Ş.

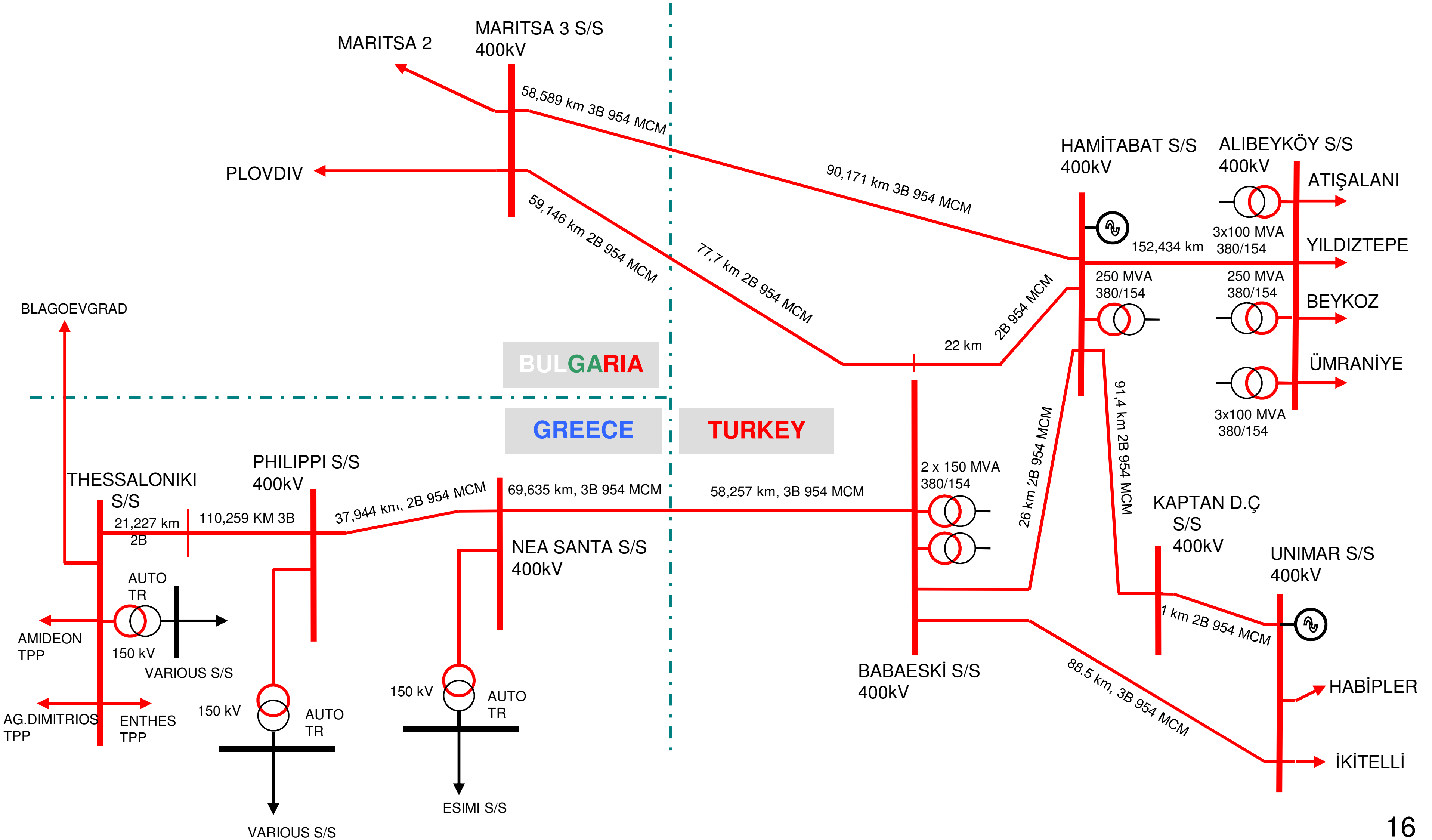
GENERAL OVERVIEW 400 kV EAST MEDITERRANIAN REGION



- Existing 400 kV OHL
- Planned 400 kV OHL

TR-ENTSO-E CONNECTION

TR-ENTSO-E Connection



MAIN TOPICS FROM THE LAST ENTSO-E PLENNARY MEETING

- ***The indices associated with short time intervals in the last months of the year 2012 as well as during the first four and a half months of 2013 are kept within the limits specified by the Project Group. Most important is that this good performance is maintained for several months.***

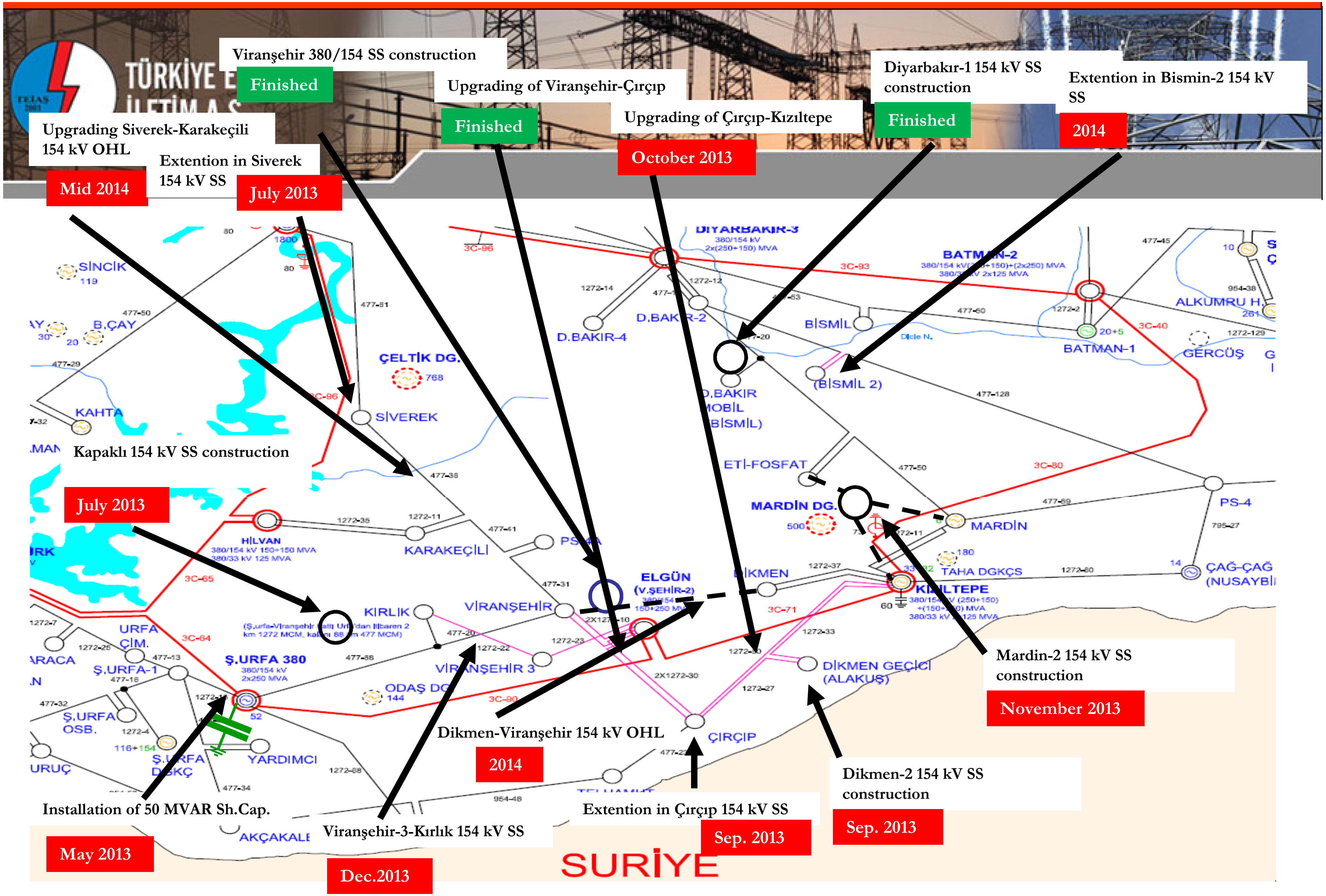
- ***Since the AGC performance is becoming better and ACE indices are kept within the limits (last months), the adverse effects in the inner Balkan system have been reduced as depicted by the power flow variations over the line Nis – Sofia West which have also reduced.***

- ***Take further actions in order to resolve the irrigation problem in the area including HV/MV substation enhancements and Distribution level upgrades. As necessary also install in the regions/substations with high irrigation load, Shunt Capacitors, SVCs or STATCOM to avoid voltage collapse due to high pumping load. Take all appropriate measures to avoid uncontrolled reconnection of pumps which leads in turns to new voltage dips and disconnection***

Investments in HV South East Turkey

Project	Charecteristics	Budget (€)	Status	Tender	Contract Finalization
Batman2-Bismil	154 kV, 2x1272 MCM 53 (5+40+6) km	4.249.533	Planning	Mid of 2013	Mid of 2014
Diyarbakır 1 SS Connections	154 kV, 2x1272 MCM, 27 km	2.422.234	Planning	2013 Jan.	End of 2013
Kırlık SS	154/33 kV 2x100 MVA	2.974.673	Planning	Mid of 2013	Mid of 2014
Karakeçili-Siverek TL (Upgr.)	154 kV 1272 MCM 36 km	1.529.832	Planning	Mid of 2013	Mid of 2014
Statcom		7.224.205	Tendering		
(Batman – Ilısu)-Gercüş TL	154 kV 2x1272 MCM 1,5 km.	127.486	Planning		
Kozluk SS	154/33 kV 100 MVA		Planning		
Savur SS	154/33 kV 100 MVA		Planning		
Kapaklı SS	154/33 kV 100 MVA		Site Selection		

- **There are 24 projects in the region which are finalized or under construction or in tendering stage.**
- **The total estimated budget for those projects are ~63.9 million€**


Viranşehir 380/154 SS construction
Finished
Upgrading of Viranşehir-Çırçıp
Finished
Upgrading of Çırçıp-Kızıltepe
October 2013
Diyarbakır-1 154 kV SS construction
Finished
Extention in Bismin-2 154 kV SS
2014
Upgrading Siverek-Karakeçili 154 kV OHL
Mid 2014
Extention in Siverek 154 kV SS
July 2013
Kapaklı 154 kV SS construction
July 2013
Mardin-2 154 kV SS construction
November 2013
Dikmen-Viranşehir 154 kV OHL
2014
Dikmen-2 154 kV SS construction
Sep. 2013
Extention in Çırçıp 154 kV SS
Sep. 2013
Installation of 50 MVAR Sh.Cap.
May 2013
Viranşehir-3-Kırlık 154 kV SS
Dec.2013
DİYARBAKIR-3
BATMAN-2
SİVEREK
ÇELTİK DG.
KAHTA
HİLVAN
KARAKEÇİLİ
VİRANŞEHİR
VİRANŞEHİR 3
KIRLIK
ELGÜN
Ş.URFA 380
YARDIMCI
ODAŞ DG
ÇIRÇIP
DİKMEN GEÇİCİ (ALAKUŞ)
KIZILTEPE
MARDİN
MARDİN DG.
ETİ-FOSFAT
BİSMİL
(BİSMİL 2)
D.BAKIR-4
BATMAN-1
GERCÜŞ
ALKUMRU H.
PS-4
TAHA DGKÇS
ÇAĞ-ÇAĞ (NUSAYBİ
AKÇAKALE
SURİYE

Commercial Exchanges

- Started since June 2011
  - ENTSO-E -> TR 400 MW
  - TR -> ENTSO-E 300 MW

- From July 2013
  - ENTSO-E -> TR 550 MW
  - TR -> ENTSO-E 400 MW

- BG,GR
  - Monthly and Daily Auctions
- TR
  - Monthly Auctions
- TCAT (TEIAS CAPACITY ALLOCATION TOOL)
  - https://tcat.teias.gov.tr
  - Auction, Secondary Market, Nomination

NEW
ELECTRICITY MARKET LAW
No: 6446

New Law about Electricity Market

- In the existing situation TEİAŞ is both,

  1 – Transmission System Operator

  2 – Market Operator

- With the new law

  - Market Operator➔ Energy Markets Operations CO(EPİAŞ)

- The establishment and organisational structure of EPİAŞ will be prepared by EMRA in 6 months.

- The parthnership of EPİAŞ'ın :
  - State Companies(TEİAŞ, BOTAŞ, vb.) : Maximum %15
  - BİST(Borsa İstanbul A.Ş.)
  - Private Companies; distribution, generation, wholesale?

- The penalties to be applied regarding irregularities and violation of regulations in distribution activities are clearly defined.

- Because of Transition Period Agreements ended, the permission to make bileteral-agreements with market participants and sell to the spot market given to EÜAŞ and TETAŞ.

  - Within this concept, End Suppliers, are liable to get certain amount of energy from TETAŞ which the percentage will be decided by EMRA.

  - Distribution Companies, are liable to buy energy demands originating from general lighting, technical and non-technical losses from TETAŞ.

New Law about Electricity Market

- The Price Equalization Mechanisn and National Tariff application which was ended on 31/12/2012, has been extended to 31/12/2015. (End users pay the the same price for electricity all over the country)

- The expences rising from General Lighting consumption will be paid by the Ministry (Energy and National Resources)

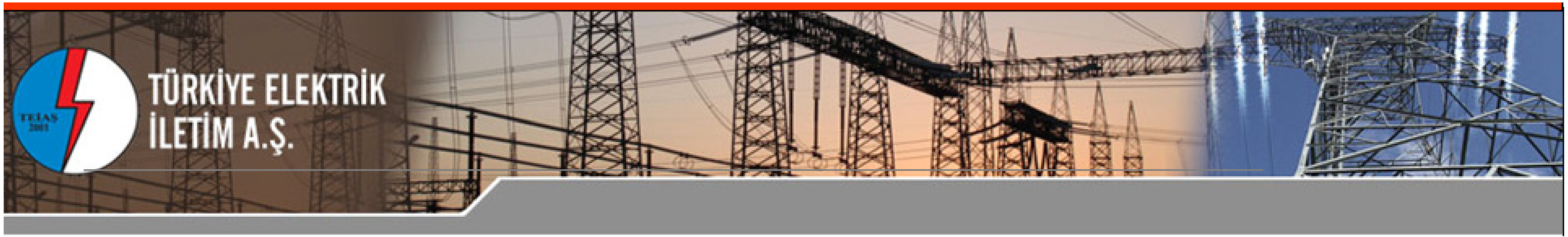
    - At Metropolitans 10 %
    - At other municipalities 5%

will be cut from the municipality's general budget and tax incomes.

New Law about Electricity Market

- **Pro-licence application is intruduced for generation facilities.**
- **24 months time is given to complete all bureaucratic and administrative tasks**

- **AIM**
  - **To protect real investors,**
  - **To realize the investments in short time periods**



Eligible Consumer: Consumer who has right to choose supplier

Limit for2013 → 5.000 kWh

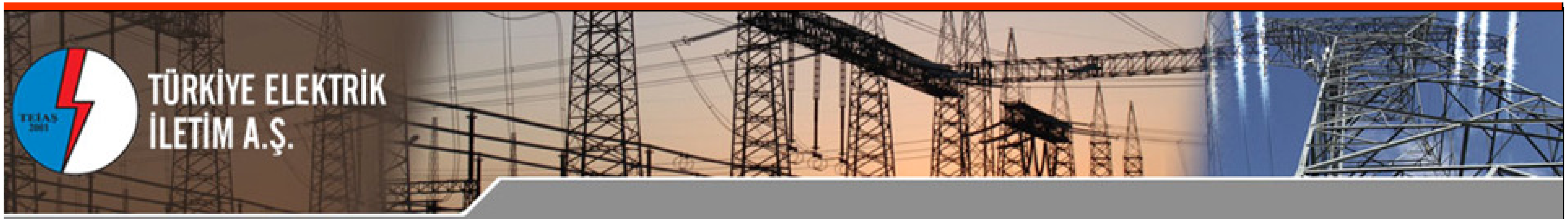
Target → 0 kWh for2015

Generation Utilities without licence

500 kW → 1 MW

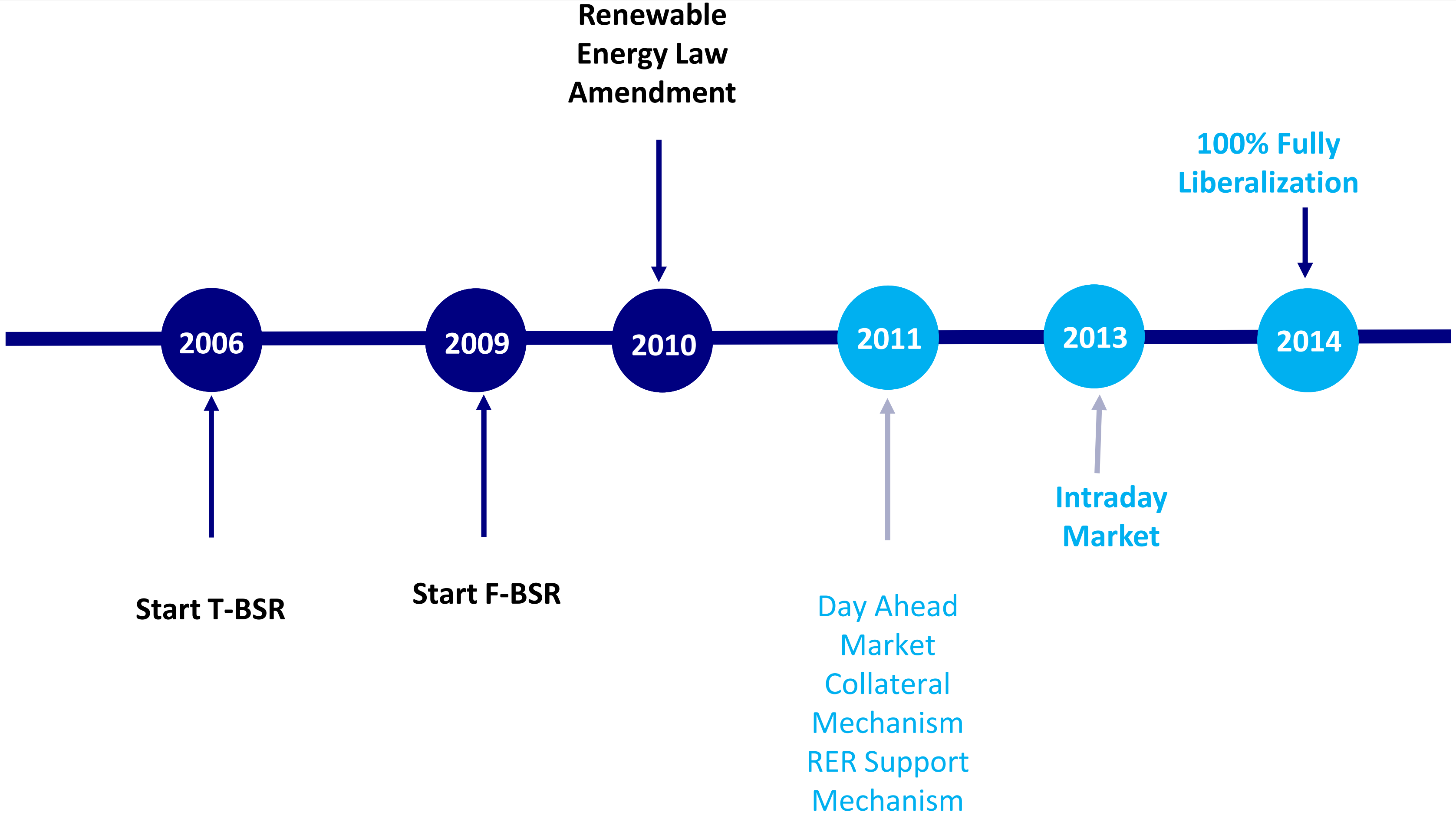
Privatization of EÜAŞ (State Owned Generation Company)

Total Installed Power EUAS	24.779 MW
Installed Power of Generation to be Privatized	16.530 MW
Installed Power of Generation which Privatization Completed	2.213 MW



ELECTRICITY MARKET

Development in Turkish Electricity Market



The Turkish electricity sector is undergoing a reform and restructuring process in order to create a liberalized, efficient and economic market.

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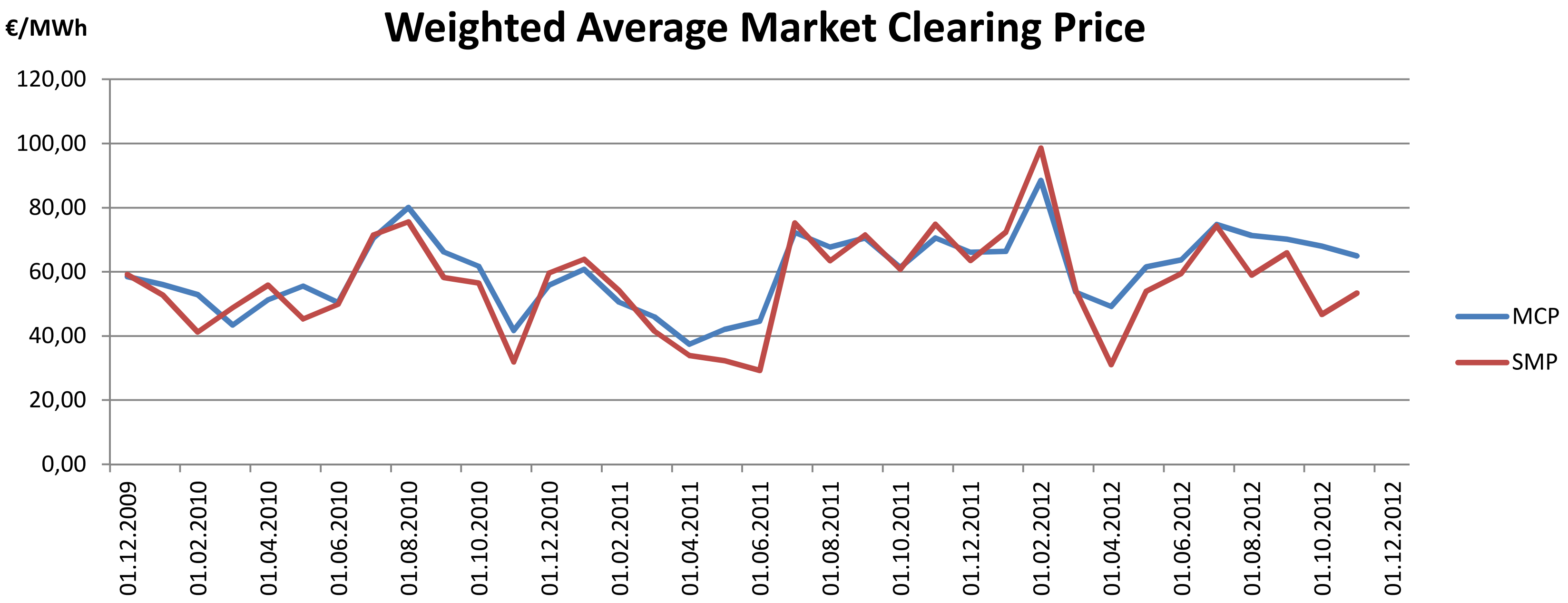
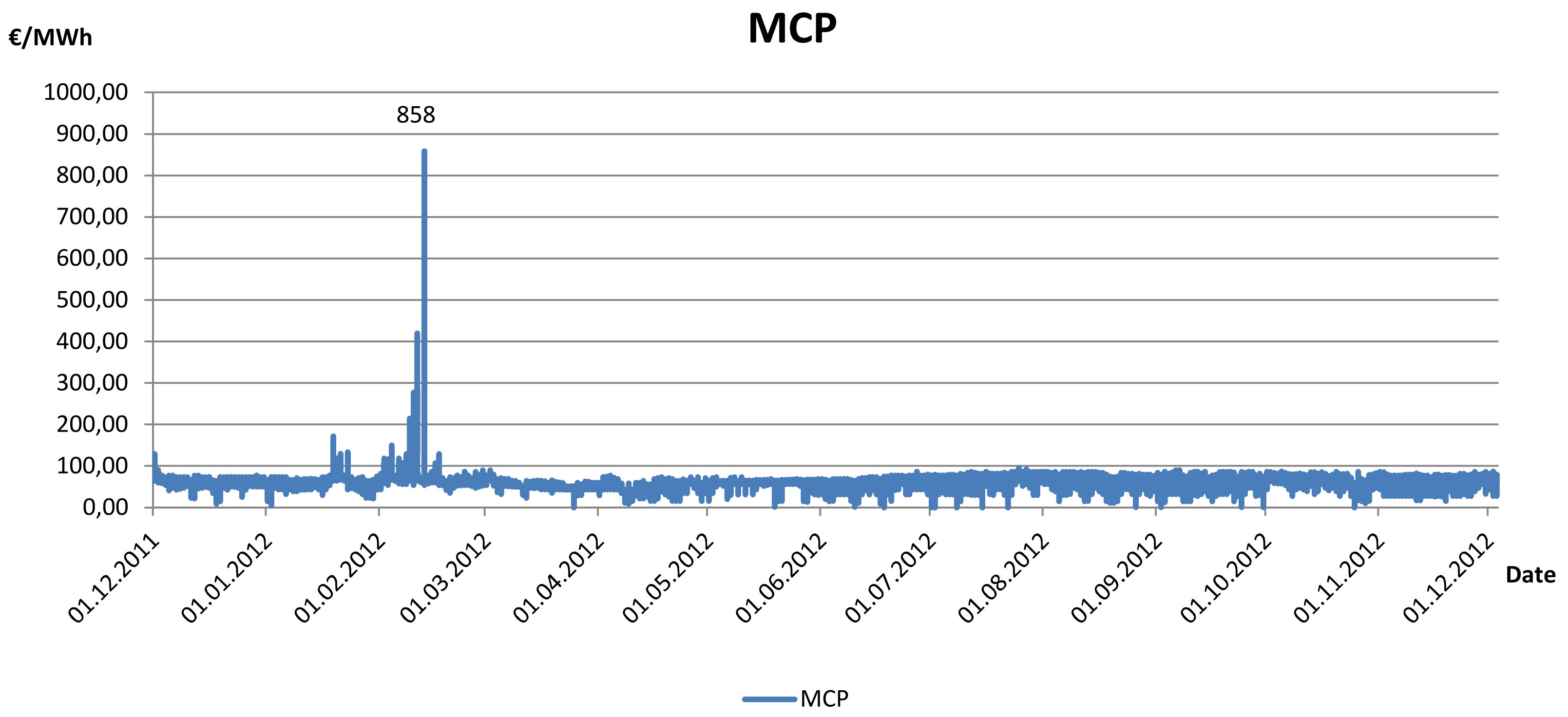
Weighted Average Market Clearing PriceDecember 2009 – December 2012



- Demand is increasing 8-10% each year. Although demand is higher than before, due to hydro generation, prices are sometimes lower than before.
- Average prices since December, 2011, when the Day Ahead Market has commenced, to the end of November, 2012 is 155 ¨/MWh (around **€ 66**) .
- Realized average of MCP in 2010 is 133 ¨ /MWh and 134 ¨ /MWh for the 2011 (around €57)

Market Clearing Prices Since DAM Opening



- We don't have prices limits but we have technical prices limits. The lower is "0" and the upper is "2.000 ¨ (about 858 €).
- We faced maximum price 3 times on same day, 13th of March 2012 since DAM commence. Due to insufficient gas pressure in pipe lines.

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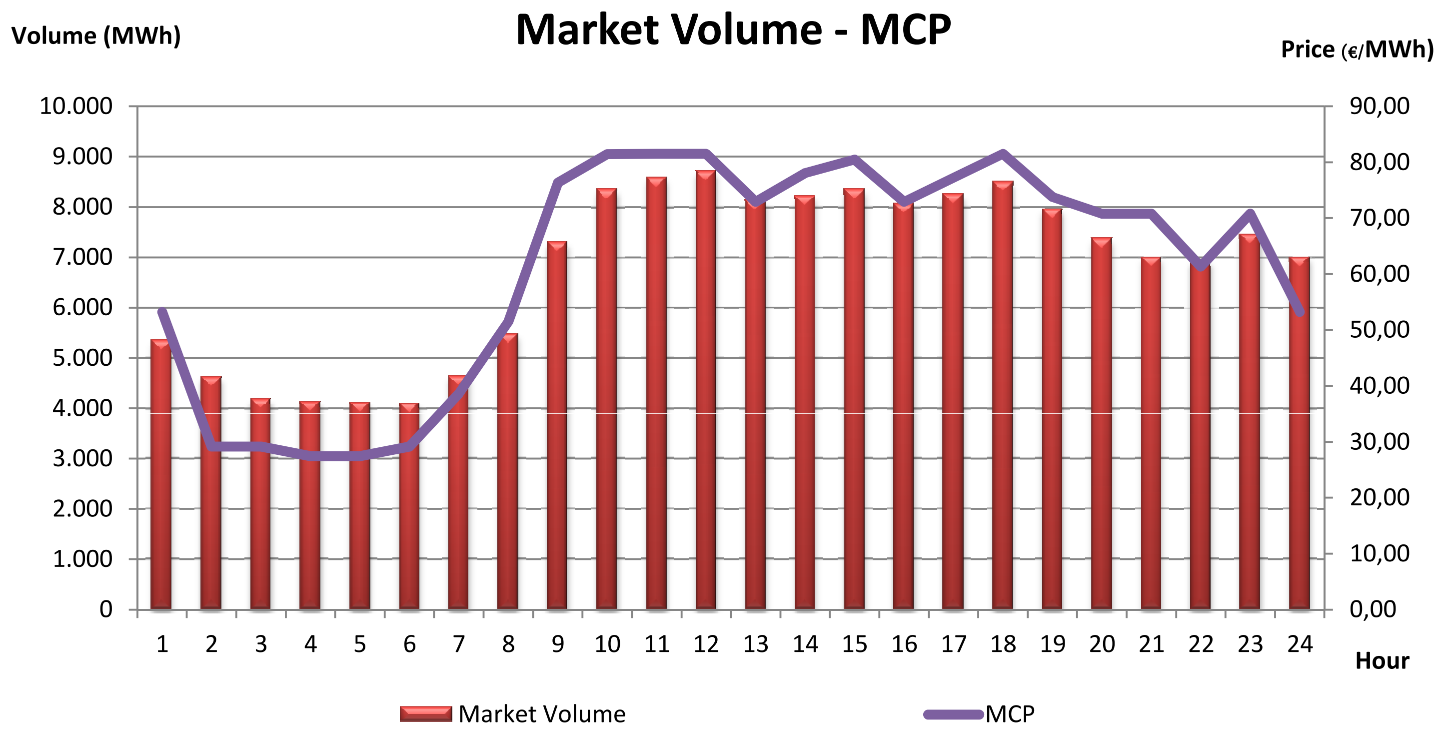
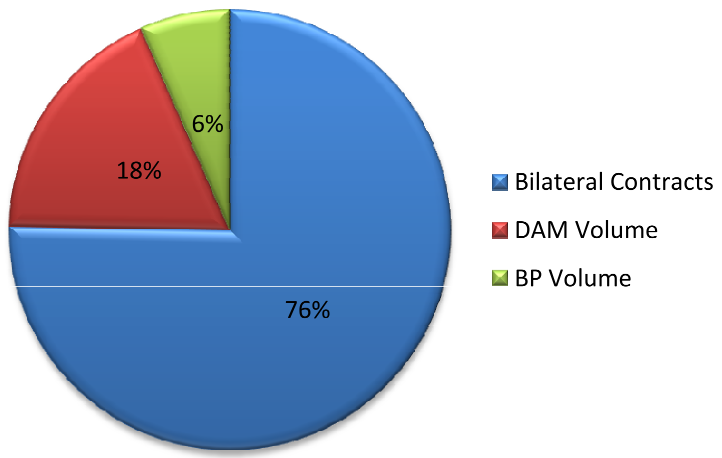
Market Clearing Volumes and Market Clearing Prices



Average Market Volume: 6780 MWh

Maximum Market Volume : 8699 MWh
Minimum Market Volume : 4101 MWh

Electricty Market Volume (%)



Nearly 25% of total energy consumption is sold through balancing market, whereas the remaining portion is through bilateral contracts.

<u>DAM Daily Cash Flow: 10,7 million €</u>

Thank you for your attention

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NCC TEIAS

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